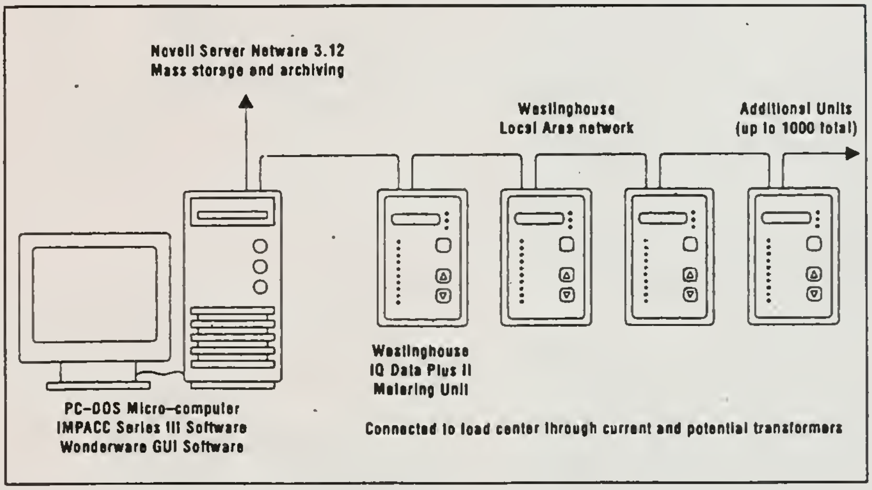
PROJECT PROFILE

TECHNOLOGY APPLICATION

Ontario

Power Distribution Control/Monitoring Technologies for Industrial and Commercial Applications

> *"This new and effective power control and monitoring technology has already saved PPG money beyond energy and water cost reduction. It has also prevented expenditures on ideas proven to be without merit. We believe that the system will be very useful in the future for monitoring base consumption and further tailoring energy reduction programs for the plant."*
>
> Brian Ormiston
> *Plant Manager*
> *PPG Canada Works #81*
> *Oshawa, Ontario*



Overview of the IMPACC Energy Monitoring System.

THE COMPANY

PPG Canada Inc. makes tempered glass products for the automotive industry. The company offers a complete line of products, including door glass, quarter glass and back windows. The tempered glass plant is located in Oshawa, Ontario.

THE CHALLENGE

The Oshawa plant relies almost exclusively on electricity for process energy. It consumes more than 40 million kWh/year of electricity. As hydro rates increased, emphasis was placed on programs to reduce the annual energy bill of more than $2.5 million. Unfortunately, little was known about the plant consumption pattern. To further complicate the problem, numerous renovations made through its 70-year history had left the plant with a disorderly power distribution system. Production centres were fed from as many as five remote feeds at 220 volts, 575V and 4,160V.

THE SOLUTION

Before committing itself to a specific reduction scheme, PPG Canada decided to install an energy-monitoring system. Furthermore, data gathered by the monitoring system would allow the company to predict the cost-effectiveness of energy projects and assist in assigning priority to capital expenditures. The Westinghouse IMPACC system was chosen, using the IQ Data Plus-II. This unit can monitor a variety of variables of a process, including voltage, instantaneous demand and cumulative power consumption. Data can be collected and interpreted in several formats by computers connected to the data network. Data on instantaneous loads and status of devices are available through the Westinghouse IMPACC and Wonderware GUI software; historical data logging is accomplished through Microsoft Excel. The Excel format allows data to be manipulated by users of personal computers at all levels. With the addition of an Allen-Bradley Data Highway Plus card, the system was expanded to provide direct communication with the shop floor through Wonderware. This will allow the system to relate electrical consumption to plant activities and to record and act on certain systems, providing control over idling motors.

The IMPACC system instantaneously monitors a number of process variables at PPG's plant, including:

- AC line current and voltage
- watts, power factor, peak demand
- frequency, cumulative watt hours

RESULTS

After the initial startup phase in 1994, the IMPACC system has performed without fail at PPG's plant in Oshawa. Historical data logging and billing software has proven to be accurate and easy to use. Based on these results, the system was recommended for installation at other PPG facilities, so that in the future it will be possible to compare energy costs and consumption patterns throughout plants in North America and Europe.

To date the system has provided valuable information regarding the effectiveness of load shedding (controlling idling motors) in PPG's facility. It highlighted the need to emphasize shutdown procedures, resulting in energy savings of $50,000 per year. It has helped PPG plan and monitor several energy conservation programs and is now being expanded to monitor both compressed air and water consumption to allow PPG to target specific reduction plans for these resources. The system has already helped the company reduce its water consumption, resulting in savings of more than $40,000 per year. A corporate goal is to reduce even further the energy costs related to production activities. During the first 18 months of the system's operation at PPG Oshawa, it has reduced energy consumption (kWh/ton product) by 18 per cent. In the future, the system will help PPG reflect the cost of energy in product pricing and allow the company to control plant activities as production levels fall.

OPPORTUNITIES

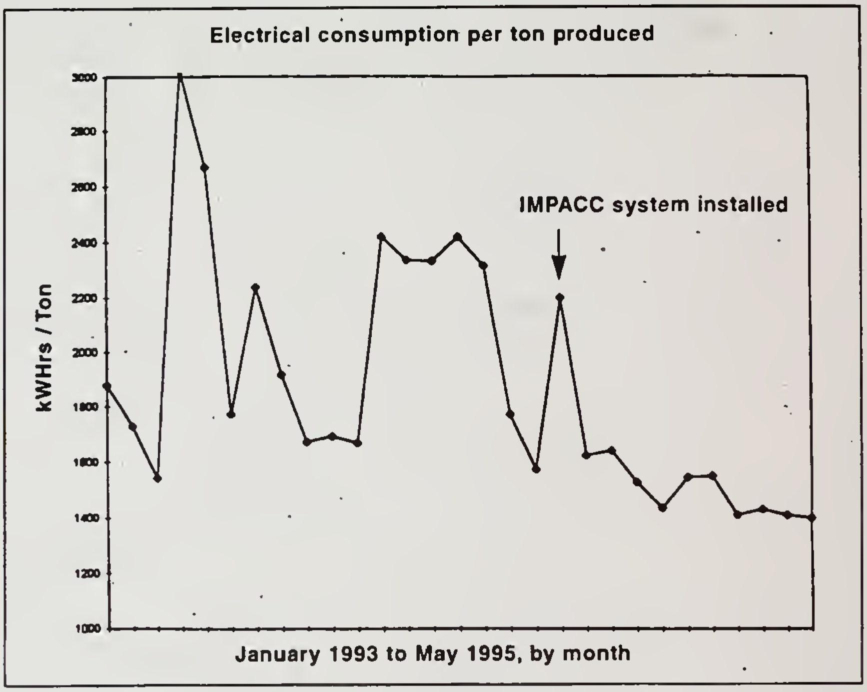
Energy consumption is a major cost in many operations. Using information gathered through the monitoring and tracking of energy throughout the plant distribution system, IMPACC can allocate energy costs by department, process or building. Not only will the true cost of an operation be evident, but the information will highlight that cost of doing business for that department, providing incentive for each department to minimize its energy usage.

With the advent of interruptible power plans from the utilities (lower rates for the option of calling a plant with one hour's notice to shed some load), detailing energy consumption down to the circuit-breaker level allows operators to take advantage of those rates, while shedding non-essential loads.

Through the use of an integrated monitoring, protection and control communication system such as the IMPACC for an entire power distribution system, operators have at their disposal information necessary to make intelligent decisions.

FINANCIAL INFORMATION

The total cost of the project was $91,500 to monitor 13 data points. This included all software, hardware and installation. Of this total $20,000 was for the creation of custom billing and data manipulation software. Base hardware and software costs, less installation, totalled $9,000 for the computer system and $2,100 per data monitoring point. Savings generated from the system are estimated at $90,000 year and should increase over its lifetime. At this level, return on investment is estimated at about one year.



PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

Industrial companies located in Ontario may seek ministry/industry services which will help them to:

- reduce, reuse and recycle solid waste;
- reduce or eliminate liquid effluent and gaseous emissions;
- use energy and water more efficiently.

FOR FURTHER INFORMATION, PLEASE CONTACT:

Neil Curliss
Senior Project Engineer
PPG Canada
155 1st Avenue
Oshawa, Ontario
L1H 7L3
Tel: (905) 725-1144, Ext. 354
Fax: (905) 725-0281

Paul Bakker
Industry Conservation Branch
Ministry of the Environment
2 St. Clair Ave. W., 14th floor
Toronto, Ontario
M4V 1L5
Tel: (416) 327-1256
Fax: (416) 327-1261
Email: bakkerp@ene.gov.on.ca

This project profile was prepared and published as a public service by the Ontario Ministry of the Environment. Its purpose is to transfer information to Ontario companies about a new application of environmental technology.

Publication of this project profile does not imply product endorsement. The ministry does not warrant the accuracy of the contents and cannot guarantee or assume any liability for the effectiveness or economic benefits of the recommendations or the technologies described herein or that their use does not infringe privately owned rights.

In addition, the ministry cannot be held liable for any injury or damage to any person or property as a result of the implementation of any part of this profile.

Pour tout renseignement en français au sujet du programme d'écologisation industrielle du Ministère de l'Environnement, veuillez composer le 416-327-1253, télécopieur 416-327-1261.

Printed on recycled paper

500 - 01 - 98 PIBS 3354E65